230. Such embodiment may also improve mechanical properties of the flow inducer assembly **300**, such as increasing mechanical strength, reducing vibration, etc. It is understood that the curved plate **310** may be attached along the aperture **242** at the downstream starting at a radial point that is below the lowest point of the aperture **242**, or above the lowest point of the aperture **242**. It is also understood that the curved plate **310** may be attached along the aperture **242** at the downstream side ending at a radial point that is below the highest point of the aperture **242**, or between the highest point of the aperture **242** and the seal arm **230**.

[0024] An axial length of the curved plate **310** may change along a radial direction. According to exemplary embodiments as illustrated in FIG. **2** and FIG. **3**, the axial length of the curved plate **310** may be shorter in the lower portion and longer in the upper portion. For example, the maximum axial length of the curved plate **310** from the lower seal plate wall **240** may be located at the upper portion of the curved plate **310** that is near a region of the top of the curved plate **310**.

[0025] FIG. **4** illustrates a schematic perspective view of a seal plate **200** having an integrated flow inducer assembly **300** according to an embodiment of the present invention. The flow inducer assembly **300** viewing in a different perspective view direction is also illustrated in FIG. **4**. As shown in FIG. **4**, the flow inducer assembly **300** may include a floor plate **320** attached to the lower seal plate wall **240** extending axially outward from the lower seal plate wall **240** at a radial location of the lowest point of the aperture **242**. The floor plate **320** may be parallel to the seal arm **230** of the seal plate **200**. The flow inducer assembly **300** may include an inner side wall **330** and an outer side wall **340** radially extending upward from the floor plate **320**. The inner side wall **330** and the outer side wall **340** may be radially attached between the floor plate **320** and the seal arm **230**. The inner side wall **330** and the outer side wall **340** are spaced apart from each other and attached at two circumferential sides of the aperture **242** forming a partial annular shape. The inner side wall **330** may be attached to the aperture **242** at the upstream side. The outer side wall **340** may be attached to the aperture **242** at the downstream side. The inner side wall **330** and the outer side wall **340** may be two curved plates. The arc length of the outer side wall **340** is longer than the arc length of the inner side wall **330** forming an inlet **350** facing to the rotation direction R of the rotor disk **120**. During operation of the gas turbine engine **100**, rotation of the rotor disk **120** and the seal plate **200** therewith makes the flow inducer assembly **300** functioned as a paddle that further induces cooling air **130**, such as ambient air from outside of the gas turbine engine **100**, in addition to centrifugal force caused by rotation of the turbine blades **140**, into the flow inducer assembly **300** through the inlet **350**, flow into the aperture **242** and the disk cavity **126** and enters insides of the turbine blades **140** from the blade roots **144** for cooling the turbine blades **140**.

[0026] FIG. **5** illustrates a schematic perspective view of a seal plate **200** having an integrated flow inducer assembly **300** according to an embodiment of the present invention. The flow inducer assembly **300** viewing in a different perspective view direction is also illustrated in FIG. **5**. As shown in FIG. **5**, the floor plate **320** is laterally extended out the outer side wall **340**. A vertical plate **342** is attached to the outer side wall **340** at the extended area of the floor plate **320** and radially extends upward from the floor plate **320**. The vertical plate **342** may be attached between the floor plate **320** and the seal arm **230**. The outer side wall **340** and the vertical plate **342** may be formed as a Y-shape. The configuration of the flow inducer assembly **300** as shown in FIG. **5** may improve mechanical properties of the flow inducer assembly **300**, such as increasing mechanical strength, reducing vibration, etc.

[0027] FIG. **6** illustrates a schematic perspective view of a seal plate **200** having an integrated flow inducer assembly **300** according to an embodiment of the present invention. The flow inducer assembly **300** viewing in a different perspective view direction is also illustrated in FIG. **6**, As shown in FIG, **6**, the floor plate **320** is laterally extended out the outer side wall **340**. The floor plate **320** is also laterally extended out the inner side wall **330** and attached to the lower seal plate wall **240**. The configuration of the flow inducer assembly **300** as shown in FIG. **6** may improve mechanical properties of the flow inducer assembly **300**, such as increasing mechanical strength, reducing vibration, etc.

[0028] Dimensions of the flow inducer assembly **300** may be designed to achieve cooling requirement for sufficiently cooling the turbine blades **140**. Dimensions of the flow inducer assembly **300** may include radial heights of the inner side wall **330** and the outer side wall **340**, circumferential distance between the inner side wall **330** and the outer side wall **340**, orientation of the inlet **350** with respect to rotation direction R of the rotor disk **120**, etc. The radial heights of the inner side wall **330** and the outer side wall **340** may be defined by a radial distance between the floor plate **320** and the seal arm **230**. The floor plate **320** may be attached to the lower seal plate wall **240** at a radial location of the lowest radial point of the aperture **242**, as illustrated in FIGS. **4-6**. It is understood that the floor plate **320** may be attached to the lower seal plate wall **240** at a radial location below the lowest radial point of the aperture **242**. The inner side wall **330** and the outer side wall **340** may be located at upstream and downstream edges of the aperture **242**, or further away from the upstream and downstream edges of the aperture **242**. Orientation of the inlet **350** may be perpendicularly to the rotation direction R which may drive more cooling air into the flow inducer assembly **300** in comparison with the orientation of the inlet **350** with an angle that is less than or greater than 90° with respect to the rotation direction R.

[0029] FIG. **7** illustrates a schematic perspective view of a seal plate **200** having an integrated flow inducer assembly **300** according to an embodiment of the present invention. As shown in FIG. **7**, a root **244** is attached to the lower seal plate wall **240** extending radially downward. The root **244** may have a dovetail shape. A flow inducer assembly **300** is integrated to the root **244** at a side facing away from the rotor disk **120** extending outward in an axial direction. The flow inducer assembly **300** may include a curved plate **310**. The curved plate **310** may have a scoop shape. The curved plate **310** may have a similar configuration as illustrated in FIGS. **2-3**, which is not described in detail herewith.

[0030] FIG. **8** illustrates a schematic perspective view of a portion of a gas turbine engine **100** showing the last stage looking in an aft side with respect to an axial flow direction, in which an embodiment of the present invention shown in FIG. **7** is incorporated. For clarity purpose, one turbine blade **140** and one seal plate **200** are removed from the rotor disk **120**. As shown in FIG. **8**, the seal plate **200** is attached to the rotor disk **120**. The root **244** is displaced into the disk groove